

**AMENDMENTS TO THE DRAWINGS**

Please find enclosed Appendix A including a complete set of the drawings, and specifically including a replacement sheet for Figure 16 which correctly describes the elements “R2” and “R3” in accordance with the Specification on page 27.

Attachment: Appendix A: Replacement Set of Drawings; Replacement Sheet for Fig. 16

### **REMARKS**

Claims 1, 2 and 4-15 are all the claims pending in the application. Claims 2 and 7 are being amended. Claim 16 is being added. Claim 6 is being canceled.

#### **I. Specification Amendments**

The Applicant has reviewed the specification to find and correct all minor errors.

#### **II. Drawings**

The Applicant herein submits a corrected Replacement Drawing of Figure 16 that correctly depicts the location of spaces R2 and R3 in relation to the separation members, as described in the specification on page 27, line 11. The Applicant thanks the Examiner for pointing out the error.

#### **III. Claim Rejections – 35 USC §103**

##### **1. Claim 1**

The Examiner rejected claim 1 under 35 USC §103(a) as allegedly being unpatentable over Hara et al. (Hara), US Patent 6,323,613, in view of Regnier et al. (Regnier), US Patent 6,236,566.

The Examiner states that “it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the fins and separation means of Hara in view of the direct contact as taught by Renier because [sic] optimizes the exchange of heat via the fins by

preventing an unwanted flow of water around them (Regnier, col. 4, lines 5-11).” *Non-Final Office Action*, p. 4, para. 1.

**A. Regnier’s Fluid Exchange Design Provides No Motivation for Establishing Line Contact Between the Heat-Sink Side Fins and Drive Unit Casing**

The Applicant respectfully disagrees with the Examiner’s conclusion that claim 1 is obvious in view of Regnier. Specifically, the motivation of Regnier, to constrain fluid to flow in the interstitial volumes V’ (Fig. 5 and col. 4, lines 9-11), is not the same motivation as the claimed invention. Regnier is attempting to optimize the flow of fluid for maximum heat-exchange of fluid, while the invention of claim 1 is directed to establishing a line contact between the drive unit casing and the heat-sink side fins to increase the resistance of heat conduction. The path of fluid is not discussed in claim 1, as it is a completely different aspect of the cooling of an electric motor. The invention of claim 1 establishes the line contact in order to reduce the heat conduction between the drive unit casing and the heat-sink side fins without the use of a heat insulator. Regnier makes no mention of line contact or establishing a state of low thermal conduction, unlike claim 1, because Regnier is directed to a completely different aspect of cooling—that of improving the flow of fluid around the fins. *Regnier*, col. 4, lines 5-11.

Regnier therefore fails to obviate claim 1, as Regnier is not directed to increasing the resistance of heat conduction using a line contact between the heat-sink side fins and drive unit casing, as described in claim 1.

**B. Regnier Does Not Explicitly Disclose Direct Contact Between the Fins and the Drive Unit Casing**

The Examiner relies upon Figure 5 of Regnier as disclosing the element of claim 1 where “the heat-sink side fins and the drive unit casing contact with each other in a state of low thermal conduction, wherein the low thermal conduction *is the line contact for the heat-sink side fins and drive unit casing.*” *Claim 1.* Claim 1, as well as Applicant’s specification, are explicit about the direct contact between the heat-sink side fins and drive unit casing, as the line contact is critical to establishing the state of low thermal conduction between the two elements.

The Examiner is merely assuming that Regnier implies direct contact between the insert 46 and fins 44, as Regnier makes no mention of those elements being in direct contact. Regnier makes no mention of actual direct contact between the fins 44 of either power module 38 or direct contact between the fins 44 and the insert 46, primarily because direct contact is irrelevant to the cooling design in Regnier. In fact, *Regnier appears to teach the opposite of direct contact* in Figure 6, where the fins 144 and 144’ are shown clearly separate, which Regnier discusses as another option to maximizing the exchange of heat. *Regnier*, col. 4, lines 12-15, and Fig. 6. The Applicant submits that Regnier does not teach direct contact, and in fact more clearly teaches that direct contact is not needed, as discussed in Regnier with regard to Figure 6.

Therefore, Regnier cannot be said to obviate the line contact of claim 1, as Regnier fails to disclose where the insert 46 is in direct contact with the fins 44.

Even if the Applicant assumes, *arguendo*, that the fins 44 are in direct contact with the insert 46, the Applicant still maintains, as stated in Section A. above, that Regnier provides no motivation for direct contact between the heat-sink side fins and insert 46 such that would obviate the elements of the invention described in claim 1.

### **C. Conclusion**

Therefore, the Applicant submits Regnier and Hara, taken alone or in combination, fail to teach, suggest, or provide any motivation for a drive unit with a line contact for the heat sink side fins and drive unit casing, as described in claim 1. Since Regnier is focused on maximizing a flow of fluid, it does not provide any teaching, suggestion or motivation for line contact between the heat-sink side fins and drive unit casing in order to increase the resistance of heat conduction, as described in claim 1. The Applicant therefore requests that the rejection of claim 1 under 35 USC §103 be withdrawn.

#### **2. Claim 2**

The Applicant herein amends claim 2 to further describe how the drive unit casing comprises drive unit casing side fins extending into the space toward the heat sink, and how the separation means is a one plate-shape. Support for these amendments can be found on page 23 of the specification, and in Figure 13. The single plate shaped separation means 60 has a dual purpose: insulating heat between the drive unit casing side fins 22 and the heat sink side fins 56; and insulating the drive unit casing 2 and inverter casing 5. The dual-purpose of the single plate-shaped separation means provides the benefit of reducing manufacturing costs.

The Applicant submits, in lieu of these amendments, that claim 2 is allowable over the cited references. Neither Hara, Nishizawa or Regnier disclose where drive unit casing side fins extend into the space toward the heat sink, and where the separation means is a single plate-shape. Furthermore, none of the cited references, taken alone or in combination, teach, suggest, or provide any motivation for a single plate-shaped separation means, as described in claim 2 and embodied in Figure 13.

**3. Claim 7**

Further to the discussion above regarding claim 2, claim 7 has been amended to depend from claim 2. The Applicant submits that claim 7 is also allowable at least based on its dependency to claim 2, but further because claim 7 describes how the single plated-shaped separation means compartments the space into a first chamber R1 and a second chamber R2. Neither Hara, Nishizawa or Regnier disclose such a design.

Therefore, the Applicant submits that claim 7 is also allowable over the cited references, and respectfully requests that the rejection under 35 USC §103(a) be withdrawn.

**4. Claim 12**

The Examiner rejected claim 12 under 35 USC §103(a) as being unpatentable over Hara, in view of Baeumel et al. (Baeumel), US Patent 6,198,183. The Examiner specifically states that “Baeumel teaches the cooling fins 42 of the motor control unit *and the drive unit motor casing* 23 in direct contact with the separation means 7,” and concludes that it would have been obvious to combine Hara and Baeumel to provide a separation means in direct contact with heat-sink side fins and a drive unit casing.

The Applicant respectfully disagrees, and points out that Baeumel fails to disclose *both* the fins and the drive unit motor casing in direct contact with the separation means 7, as disclosed in claim 12. Baeumel, in col. 7, lines 51-64, only discloses where *one side* of the thermal insulation layer 7 is adhesively bonded to the geometric protrusions 42 on the bottom surface 41 of the cooling insert 4. Baeumel fails to disclose direct contact with the drive unit motor casing 23 and the separation means 7, as described in claim 12.

Therefore, the Applicant submits that neither Hara nor Baeumel, taken alone or in combination, teach, suggest or provide any motivation for the elements of claim 12. The Applicant respectfully requests that the Examiner withdraw the rejection of claim 12 under 35 USC §103(a).

#### **IV. Double Patenting**

The Examiner rejected claim 13 on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over claim 1 of US Patent 7,102,260.

The Applicant herein files a Terminal Disclaimer to overcome the nonstatutory obviousness-type double patenting rejection of claim 13.

#### **V. Allowable Subject Matter**

The Applicant thanks the Examiner for the indication that claim 4 represents allowable subject matter.

#### **VI. Conclusion**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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